

CHAPTER 2

AUTOMATIC OPENING DEVICES

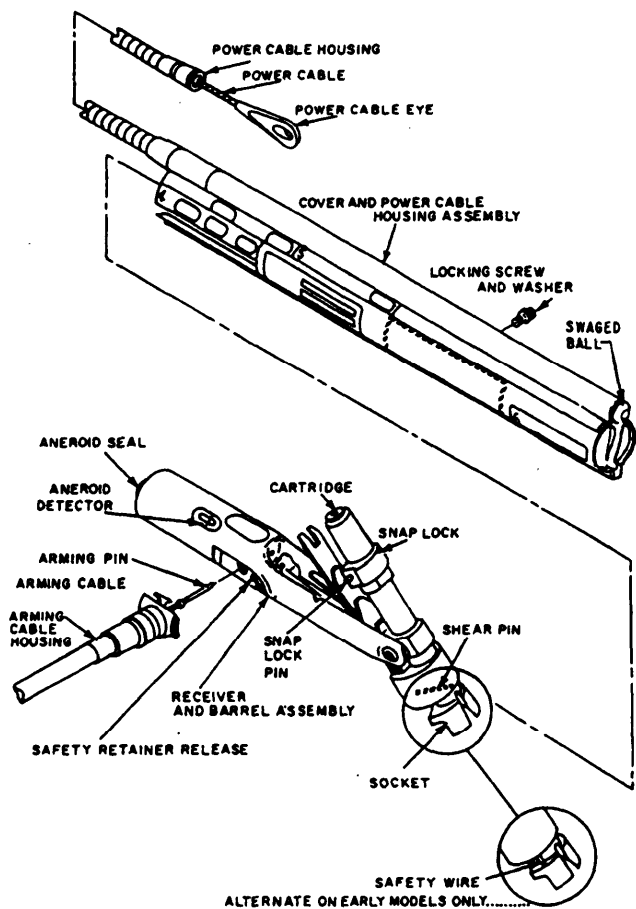
Learning Objective: Upon completion of this chapter, you will be able to recognize, inspect, and maintain cartridges and cartridge-actuated devices used with personnel emergency parachute assemblies.

As you look around the parachute loft, you will see that it is a very clean, neat, and safe-looking place to work. Although it has this appearance, there are a few places that are very dangerous. One of the more hazardous places is the packing table. The packing table may look as safe to you as sitting at home in your easy chair watching television. However, on the packing table you will find automatic opening devices. There are two basic opening devices used in the operation of personnel parachutes.

The first is the automatic parachute ripcord release. Working with this actuator is the same as working with a loaded .38 caliber pistol. The second is the ballistic spreader gun. This gun has a cartridge; and when fired, it gives the same effect as an exploding hand grenade. Working with any opening device requires extreme caution—all safety precautions must be taken to ensure your safety as well as that of your coworkers. This chapter will help you understand the operation, function, and maintenance of this equipment.

AUTOMATIC PARACHUTE ACTUATORS

The Navy currently uses the Model 7000 automatic parachute ripcord release (fig. 2-1) in its personnel parachute assemblies. It is a barometrically controlled, pyrotechnic device. The actuator is designed to open a parachute at a preset altitude. The Model 7000 automatic parachute ripcord release is available with two different altitude settings. One is the 10,000-foot setting, plus or minus 1,000 feet (identified by green labels on the cover assembly). The aneroid is identified by a green potting seal and a white



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Figure 2-1.—Model 7000 Automatic Parachute Ripcord Release.

label with green lettering. The other is the 14,000-foot setting, plus or minus 1,000 feet (identified by red labels on the cover assembly). The aneroid is identified by a red potting seal and a white label with red lettering.

FUNCTION

It is impossible for an aircrewman to select the altitude at which an emergency may occur. By using the automatic ripcord release, you can bring the aircrewman down to a safe altitude before the parachute opens.

When an aircrewman makes an emergency ejection at an altitude above that for which the ripcord release is set to open the parachute, the following functions take place:

1. The arming pin is pulled. This pin locks the ripcord release firing mechanism while installed. When the arming pin is withdrawn, the assembly fires at or below the preset altitude of the ripcord release.

2. The sear and the aneroid mechanism lock the ripcord release.

3. As the aircrewman free-falls, increasing air pressure causes the aneroid to contract.

4. As the operating altitude is reached, the aneroid contracts enough to remove the sear from the firing hammer lock.

5. The hammer's firing pin strikes the cartridge.

6. The time-delay cartridge fires (time depending on the type of cartridge used) after the hammer strikes.

7. The piston is forced forward in the barrel, pulling the power cable, which is attached to the parachute locking pins. (The power cable travels 3.75 inches.)

8. The locking pins are pulled, and the normal parachute opening sequence begins.

When an aircrewman bails out below the operating altitude of the automatic parachute ripcord release, the hammer releases as soon as the arming pin is pulled, and the following functions take place:

1. The hammer's firing pin strikes the cartridge.

2. The time-delay cartridge fires (time depending on the type of cartridge used) after the hammer strikes.

3. The piston is forced forward in the barrel, pulling the power cable, which is attached to the parachute locking pins.

4. The locking pins are pulled, and the normal parachute opening sequence begins.

PREPARATION FOR USE

When you receive an automatic parachute ripcord release from supply, there are some preparations for you to make before placing it into service. Upon removal of the ripcord release from the shipping carton, the exterior parts of the unit must be inspected for damage during shipping and storage. An inspection should be made for corrosion, dirt, dents, and cracks. If any damage or discrepancy is found, a quality deficiency report must be submitted, and a tag must be affixed to the ripcord release stating that it is not to be used. Remove this tag only after correction has been made. Fired ripcord release assemblies must not be reused.

All Model 7000 automatic parachute ripcord release assemblies that fail any inspection points must have a tag affixed stating the nature of the defects.

NOTE: Refer to NAVAIR 11-100-1.1 for the cartridge service life/total life. The cartridge service life must not expire prior to the next scheduled repack of the parachute assembly.

WARNING

YOU SHOULD EXERCISE EXTREME CAUTION WHEN HANDLING AUTOMATIC RIPCORD RELEASE ASSEMBLIES AFTER THE CARTRIDGE HAS BEEN INSERTED IN THE BARREL. DO NOT ALLOW EITHER END OF THE COVER ASSEMBLY TO BE POINTED TOWARD YOUR FACE AS HIGH VELOCITY FLAME AND SMOKE MAY BE PRODUCED IF THE CARTRIDGE GOES OFF. ANOTHER REASON FOR EXTREME CAUTION IS THE POSSIBILITY THAT THE PISTON OF THE RIPCORD RELEASE MAY BECOME A PROJECTILE IF THE CARTRIDGE ACCIDENTALLY FIRES.

An automatic ripcord release in service must be inspected each time its parachute assembly is repacked. You must pay particular attention to detail when working on a automatic ripcord release. The importance of careful work must be impressed upon personnel actually performing the work, as well as those assigned to collateral duty

inspections. You will find more detailed information concerning automatic parachute ripcord release assemblies in the *Emergency Personnel and Drogue Parachute Systems Manual*, NAVAIR 13-1-6.2, and the *Maintenance Requirements Cards*, NAVAIR 13-600-4-6-3.

MAINTENANCE

Maintenance on any automatic ripcord release in service must be performed each time its parachute assembly is repacked. Maintenance consists of the following:

- Disarming
- Inspection
- Firing altitude check
- Arming and assembly
- Checkout of armed mechanism

As you work on a automatic ripcord release assembly, you are required to perform several different types of maintenance and inspections. You are required to inspect the operational condition of the automatic ripcord release before installing it in a parachute assembly. If you find any damage or an inspection discrepancy, submit a quality deficiency report, as discussed in OPNAVINST 4790.2 (series).

NOTE: Under no circumstances should an unsatisfactory ripcord release be installed.

The first step in performing the normal inspection and maintenance on a automatic ripcord release is to disarm it. Then you are ready to inspect and perform the firing altitude checks.

DISARMING

Anytime you are required to disarm a ripcord release assembly, follow the procedures outlined in NAVAIR-13-1-6.2. The discussion that follows closely parallels those procedures. A parts breakdown can be seen in figure 2-1.

NOTE: To remove the arming cable housing from the ripcord release, depress the safety retainer release (fig. 2-1). NEVER try to remove the arming cable from an armed ripcord release assembly by pulling on the cable. This fires the automatic ripcord release.

1. Open the ripcord release pocket, and remove the ripcord release only a sufficient distance to allow disassembly.

2. Remove the locking screw and washer.

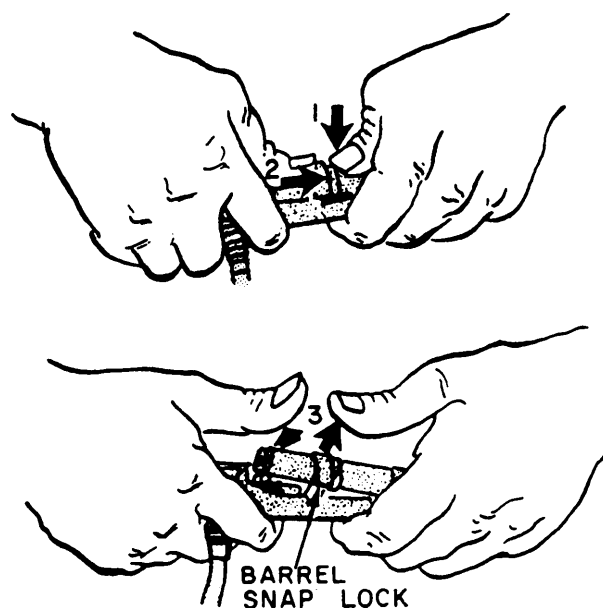
NOTE: The cover and power cable housing assembly and the receiver and barrel assembly are serialized matched sets. Do not mix these assemblies.

3. Slide the cover off the receiver and barrel assembly.

4. Disengage the barrel snap lock. A close-up of this operation is shown in figure 2-2.

5. Remove the cartridge from the barrel assembly (fig. 2-1). Do not proceed until the quality assurance inspector (QA) has verified this step.

6. Remove the ripcord release assembly and the arming cable housing from the parachute container.



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Figure 2-2.—Disengaging barrel snap lock.

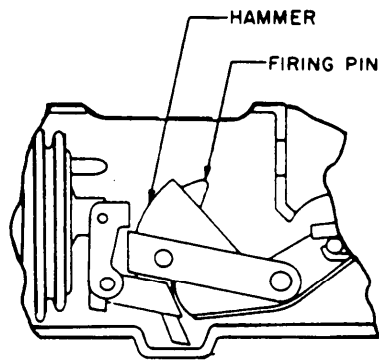


Figure 2-3.—Checking firing pin and hammer.

INSPECTION

To inspect the automatic ripcord release, proceed as follows:

1. Inspect the cover and power cable housing assembly for nicks, gouges, distortion, corrosion, and security of the power cable housing.
2. Inspect the power cable for freedom of movement, and secure attachment of the swaged ball and power cable eye.
3. Inspect the receiver and barrel assembly for excessive nicks, cracks, gouges, distortion, and corrosion or other damage that could cause a malfunction while in service.
4. Inspect the firing pin on the hammer for flattening, gouges, or other damage (fig. 2-3).
5. You must secure the arming pin by inserting the pin in the retainer while the barrel is unlocked. Press the pin firmly into place until it locks into the pin groove. The pin should now be held securely. Do not twist the socket as this will break the shear pin.

NOTE: Early Model 7000 automatic parachute ripcord release assemblies use safety wire, as shown in figure 2-1. When inspecting these assemblies, check for security and the proper type of wire.

6. Inspect the socket for visible damage and retention of the socket and piston by a shear pin (figs. 2-1 and 2-4).

7. Inspect the snap lock pins for security and absence of damage (figs. 2-1 and 2-5).

NOTE: If the tamper dot is broken, you need to torque the screw to a value of 14 1/2 to 15 1/2 inch-pounds and apply a new tamper dot.

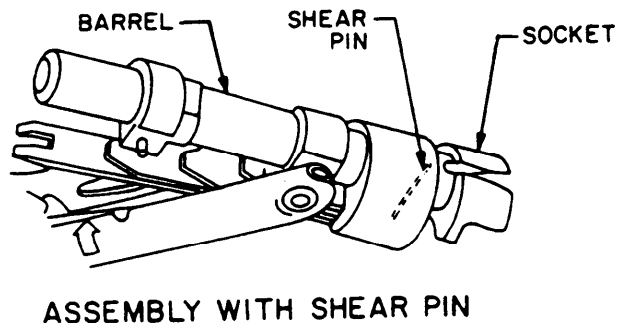


Figure 2-4.—Checking for proper retention of socket by a shear pin.

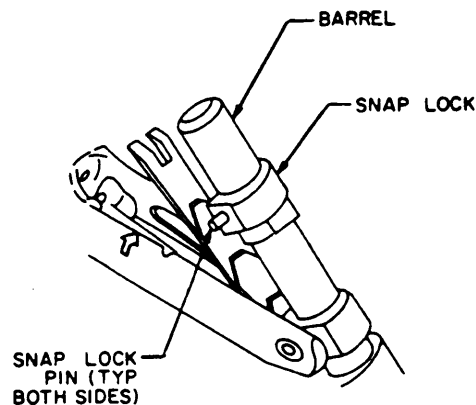


Figure 2-5.—Checking for security of snap lock.

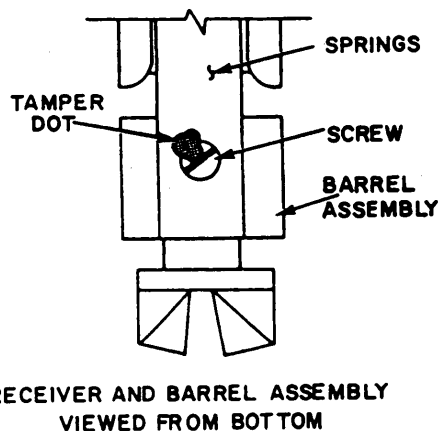


Figure 2-6.—Checking springs and tamper dot.

8. Inspect the leaf springs on the receiver and barrel assembly for damage. Make sure the retaining screw has not loosened. (Check the tamper dot on the screw and spring, as shown in figure 2-6.)

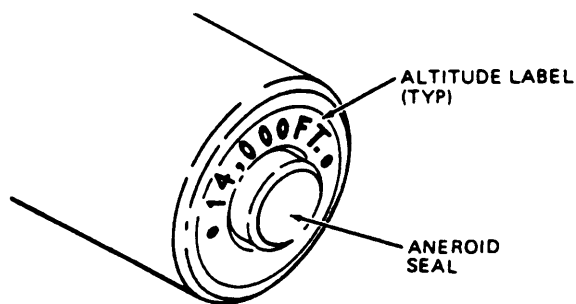


Figure 2-7.—Inspecting aneroid seal.

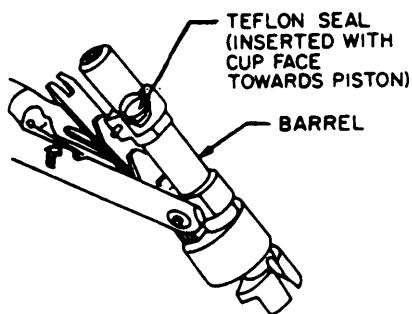


Figure 2-8.—Inspecting gasket seal.

9. Check the sealing compound on the aneroid screw, shown in figure 2-7. The seal must be intact and undisturbed. Cracks due to normal aging of seal material are acceptable.

10. Inspect the Teflon seal. Be sure that the cup side of the seal is facing the piston (fig. 2-8).

FIRING ALTITUDE CHECK

To check for the proper firing altitude of the automatic ripcord release, you must first be familiar with the automatic parachute ripcord release test set.

AUTOMATIC PARACHUTE RIPCORD RELEASE TEST SET

The automatic parachute ripcord release test set, shown in figure 2-9, is designed to test the sensitivity of the automatic ripcord release to a preset pressure altitude through use of an aneroid blocking mechanism.

The principal action that you test is the consistency of the aneroid in actuating the release mechanism at a predetermined altitude. To do

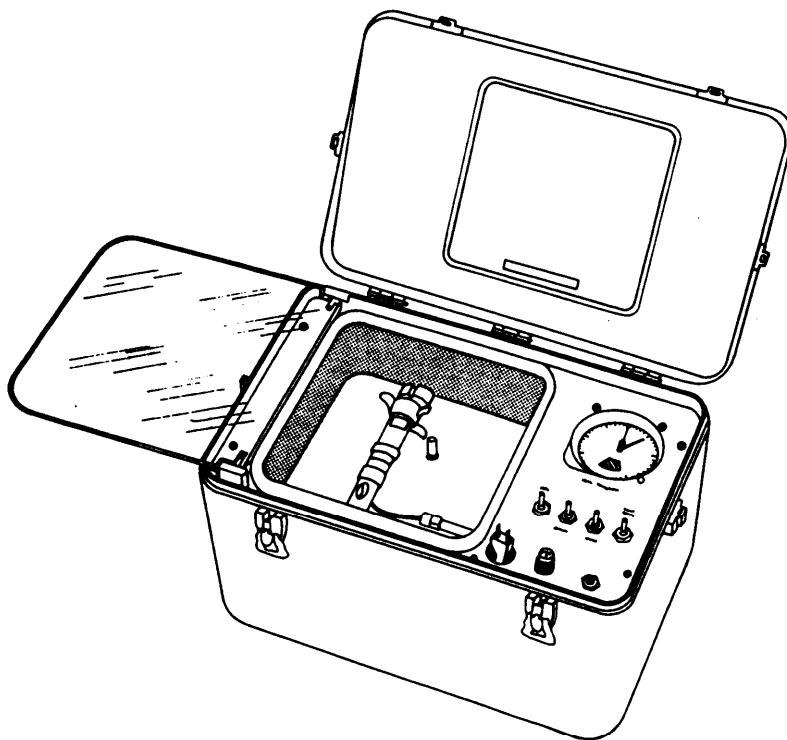


Figure 2-9.—Automatic parachute ripcord release test set.

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this, you first evacuate air from a test chamber to simulate an increase in altitude. When you have achieved a simulated altitude above the preset altitude of the ripcord release, you extract the arming pin, which arms the parachute ripcord release firing mechanism. Then you bleed outside air back into the test chamber at a controlled rate to simulate a specific rate of descent. When the pressure reaches the value for which the automatic ripcord release has been set, the aneroid will unlock the sear if the pressure sensitivity is within tolerance.

The test chamber, its evacuation system, instrumentation, and controls are packaged in one container. The test chamber is designed to withstand a vacuum equivalent to an altitude of 30,000 feet. The chamber holds the entire 7000 series automatic parachute ripcord release, and it includes the necessary brackets to support and position the ripcord release within the chamber during the test cycle. An access door/observation window is also provided.

NOTE: Before testing an automatic parachute ripcord release, the test chamber altimeter should read 29.92 inches of mercury barometric pressure.

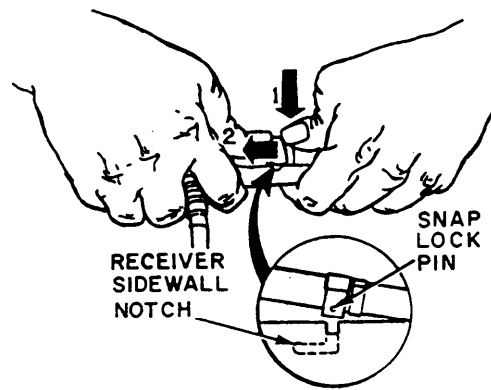
RIPCORD RELEASE TEST PROCEDURE

Plug the test unit's power cord into a 115-volt, 60 Hz, ac power source. Place the power switch in the ON position, open the test chamber door, and insert the arming pin cable into the side of the ripcord release with the aneroid end toward the operator.

To test the ripcord release, follow these procedures:

1. Ensure the test chamber has been calibrated. Install the test chamber substitute arming pin into the ripcord release. If the barometric pressure reading of the altimeter isn't 29.92, you will not get a true reading of the firing altitudes. Therefore, you must adjust the altimeter to the proper setting when required.

2. Install a dummy cartridge.



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Figure 2-10.—Locking barrel assembly.

CAUTION

DO NOT RELEASE THE RIPCORD RELEASE FIRING MECHANISM WITHOUT A DUMMY CARTRIDGE INSTALLED, AS THIS COULD DISTORT THE FIREWALL. THIS DISTORTION COULD CAUSE A LATER MALFUNCTION.

3. Press the barrel down into position in the receiver. As the barrel reaches the proper position, exert forward pressure on the snap lock, causing the snap lock pins to lock the barrel in position (fig. 2-10).

4. Install the barrel and receiver into the test chamber. Check your altimeter (fig. 2-9) for a setting of 29.92.

5. Evacuate the chamber to an altitude of 25,000 feet. This is done by using the climb toggle switch.

6. Decrease the altitude by using the descend toggle. The chamber simulates descent at a rate of 175 to 200 feet per second.

7. At approximately 20,000 feet actuate the arm toggle switch to withdraw the arming pin from the barrel and receiver.

8. At the firing altitude the ripcord release should fire. (You have a tolerance of plus or minus 1,000 feet at this time.)

9. Record the altitude at which the ripcord release assembly's firing pin strikes the dummy cartridge. The firing altitude is recorded on the parachute configuration, inspection, and history record. The quality assurance inspector will check this point of the procedure.

WARNING

AFTER TEST FIRING, YOU MUST NOT USE A METAL TOOL TO PUSH THE HAMMER AND LOCK ASSEMBLY BACK FROM THE FIRING WALL. TAKE EXTREME CARE TO AVOID SCRATCHING OR ABRADING THE POLISHED SURFACE OF THE LOCK. THE PURPOSE OF THE LOCK ASSEMBLY IS TO MATE WITH THE ANEROID SEAR AND INITIATE FIRING AT A PRESCRIBED ALTITUDE. A ROUGH OR SCRATCHED LOCKING ASSEMBLY MAY CAUSE A HANGUP DURING THE UNLOCKING FUNCTION.

NOTE: Ripcord release assemblies with part number 711-07022-30 (10,000-foot) must fire at 10,000 feet (plus or minus 1,000 feet) pressure altitude. Ripcord release assemblies with part number 711-07022-34 (14,000-foot) must fire at 14,000 feet (plus or minus 1,000 feet) pressure altitude.

10. Three firing altitude checks must be made. Any ripcord release that does not meet test requirements on all three checks will be rejected. Adjustments are not to be made.

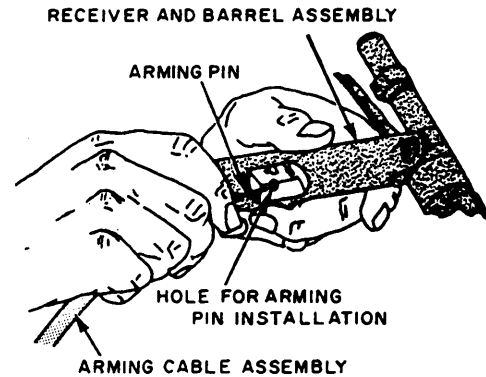
11. Remove the dummy cartridge and inspect it for an indentation caused by the hammer firing pin striking the cartridge. This dent must be visible to the QA performing the inspection.

ARMING AND ASSEMBLING THE AUTOMATIC PARACHUTE RIPCORD RELEASE

The following instructions are the same type you will follow in the shop when arming and assembling the Model 7000 ripcord release. When you use the NAVAIR 13-1-6.2 manual and come to a step that is followed by "(QA)," that step must be inspected by a QA.

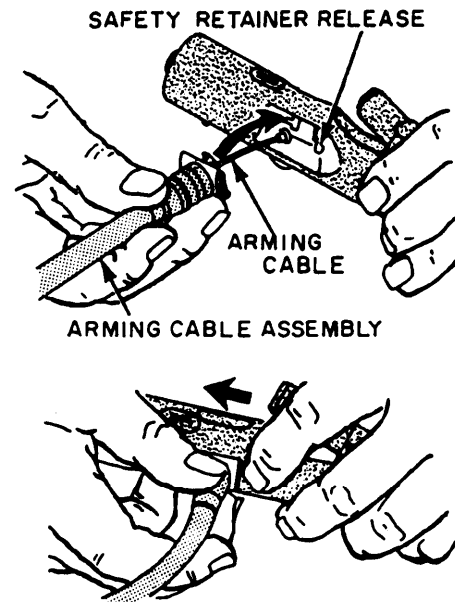
1. To arm the ripcord release that is installed in a parachute, your first step is to insert the arming cable housing through the holes in the parachute container and ripcord release pocket.

2. Next, feed the arming cable through the arming cable housing. Depending on application, the arming cable may be inserted at either side of receiver and barrel assembly (fig. 2-11).



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Figure 2-11.—Installing an arming cable.



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Figure 2-12.—Installing an arming cable housing.

3. With the ripcord release barrel in the open position, install the arming pin into the ripcord release. The pin must pass through the hole in the side of the receiver, through the firing mechanism lock, and out the opposite side of the receiver.

4. Next, you connect the arming cable housing to the receiver and barrel assembly. Ensure the safety retainer secures the housing to the receiver (fig. 2-12). Be sure that you check the cartridge service life at this time. You should not install a cartridge that will expire prior to the next scheduled repack of the assembly. Refer to NAVAIR 11-100-1 for the service/total life of cartridges.

5. You should enter the cartridge time delay, part number, type, expiration date, lot number, can open/installation date, the CAD DODIC (Department of Defense Identification Code), and the date of manufacture or overhaul on the parachute Configuration, Inspection, and History Record.

6. Insert a proper time-delay cartridge in the barrel. Refer to the applicable parachute chapter to determine which time-delay cartridge should be used. While you are pressing down on the barrel, look through the inspection hole in the receiver and ensure that the hammer assembly does not swing towards the firewall. If the hammer swings, the arming pin is improperly installed. Do not attempt to assemble the ripcord release any further, as this could fire the cartridge.

7. Press the barrel down into position in the receiver (fig. 2-10). As the barrel reaches proper position, exert forward pressure on the snap lock. This causes the snap lock pins to lock the barrel in position. Ensure that the snap lock is aligned with the alignment arrow.

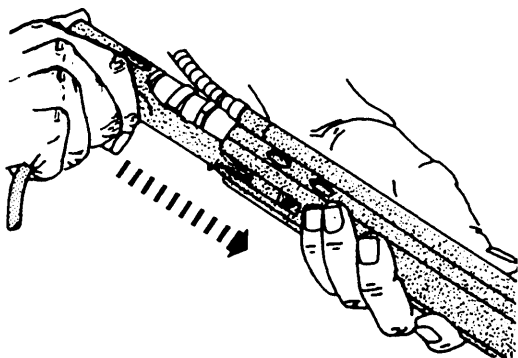
8. Hold the ripcord release, as shown in figure 2-13, and slide the receiver and barrel assembly into the cover and power cable assembly until the holes for the screw are aligned.

9. Install the locking screw and lock washer. Apply a tamper dot to the locking screw, using red lacquer.

CHECKOUT OF ARMED RIPCORD RELEASE

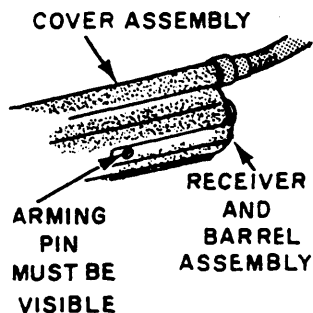
To check out an armed automatic ripcord release, you should proceed as follows:

1. Check the arming cable for proper installation, as shown in figure 2-14. The arming pin must be visible (extending through the side of the receiver).



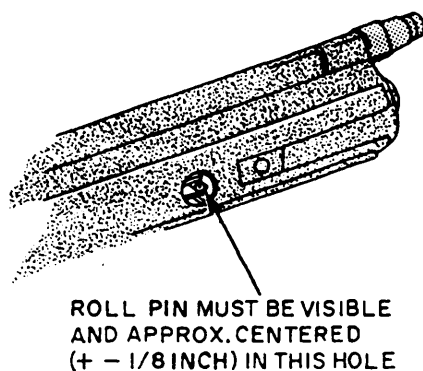
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Figure 2-13.—Sliding receiver and barrel into cover assembly.



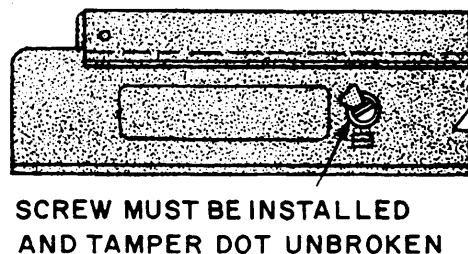
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Figure 2-14.—Checking arming pin for proper installation.



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Figure 2-15.—Checking roll pin.



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Figure 2-16.—Checking lock screw.

2. Check for correct position of the spring and centering of roll pin in hole (fig. 2-15).

3. Check to make sure the locking screw is installed. Be sure that the tamper dot isn't broken (fig. 2-16).

4. Check for proper position of the aneroid (fig. 2-17).

5. The cartridge must be installed (fig. 2-18). Look through the port and verify that the cartridge is installed.

6. Complete the ripcord release installation in accordance with the applicable parachute chapter in NAVAIR 13-1-6.2.

To install an automatic parachute ripcord release, you must refer to the *Emergency Personnel and Drogue Parachute Systems Manual*, NAVAIR 13-1-6.2.

BALLISTIC SPREADING GUN ASSEMBLY

The ballistic spreading gun is a mechanically actuated device that ensures rapid inflation of the

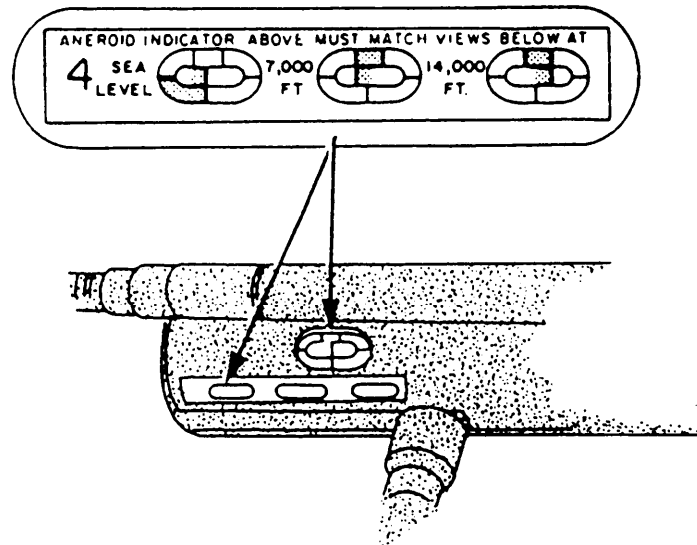


Figure 2-17.—Checking for proper position of aneroid.

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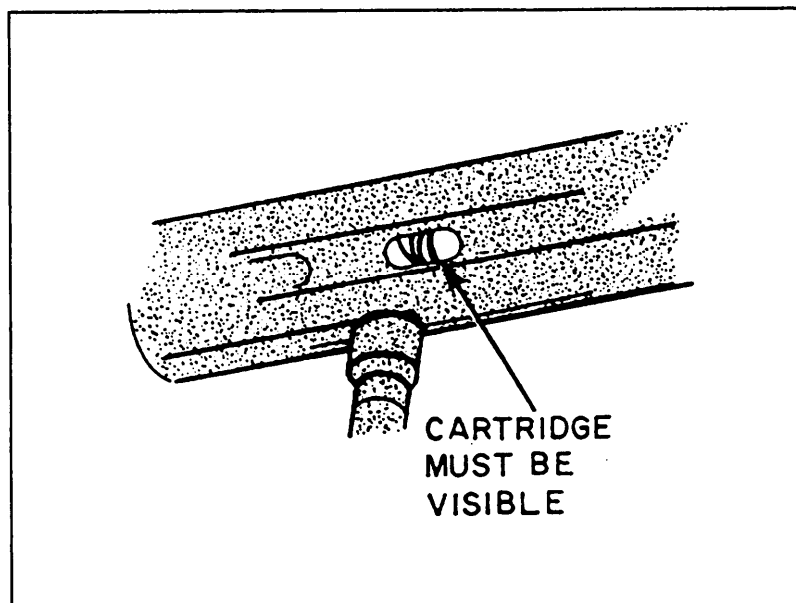


Figure 2-18.—Checking for cartridge.

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main parachute canopy, and it reduces random inflation time of the canopy during high-speed ejections (figs. 2-19 and 2-20).

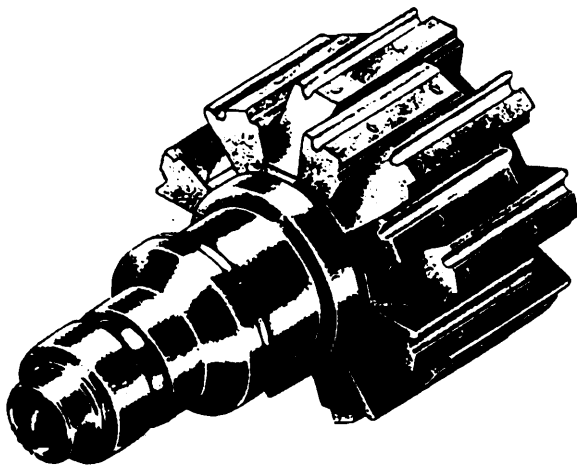
DESCRIPTION

The spreader gun assembly consists of a spreader housing, 14 pistons, slugs, and retainers, an impulse cartridge, a fail-safe mechanism, and a hardware retention lanyard.

The spreader gun is provided with a fail-safe assembly in the event of a cartridge malfunction. The fail-safe assembly consists of a nylon sleeve clipped to the sheer band assembly.

A safety pin is inserted in the firing mechanism during handling to prevent accidental firing. The cartridge for the spreader gun is threaded into the breech of the housing and has a retention cord attached. The spreader gun is positioned at the hem of the main parachute between the retaining cord and lower firing lanyards.

The retaining cord is looped around the vent lines and the pilot parachute connector cord.



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Figure 2-19.—Spreading gun assembly.

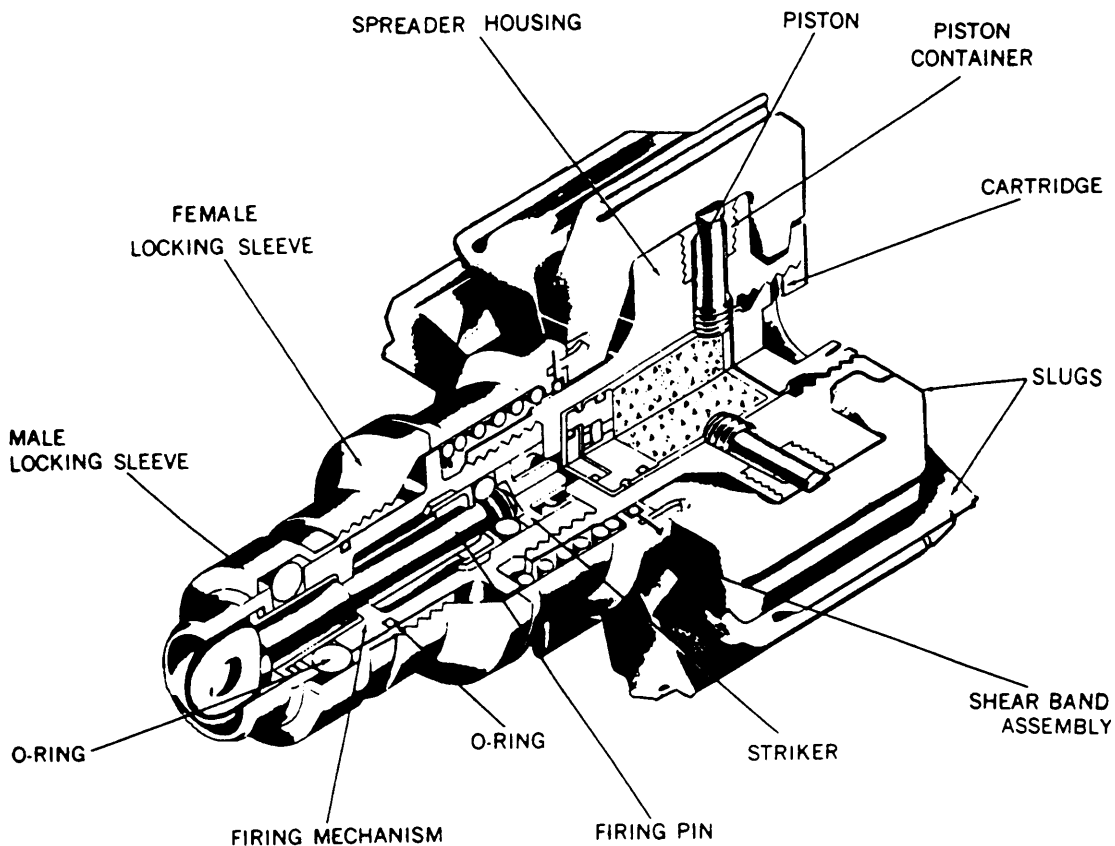


Figure 2-20.—Spreading gun assembly parts breakdown.

The lower firing lanyard is attached to the connector link next to the suspension lines. Two suspension lines and a loop from the parachute hem are attached to each slug. A cover plate holds the two lines and loop in the channels of each slug.

OPERATION

When actuated, the parachute canopy deploys by either an internal pilot chute or by the external pilot chute. Just prior to full canopy and suspension line deployment, the firing lanyard pulls the firing pin from the firing mechanism. This releases the striker, which strikes the cartridge primer. As the cartridge fires, the 14 slugs are propelled outward. They simultaneously drag the attached suspension lines outward in a 360-degree spread. This firing sequence occurs prior to any tension being placed on the suspension lines. Spreading is stopped when tension starts to build up in the suspension lines; so, at high speed it produces a 4-foot diameter mouth, and at low speed, it produces an 8-foot diameter mouth.

In the event of a cartridge malfunction, a "fail-safe" backup subsystem operates. After the firing pin is withdrawn, the firing lanyard exerts 25 to 38 pounds of tension on the fail-safe assembly sleeve, which retracts the shear band assembly. This releases the slugs and allows the canopy to inflate aerodynamically.

IDENTIFICATION AND HANDLING

An identification tag is attached to the spreader gun and contains the following data: nomenclature, manufacturer's part number, revision status, serial number, date of manufacture, and name and address of the manufacturer.

A warning label is sewn on each side of the sleeve protecting the firing lanyard and to the outer pack assembly. This label reads as follows:

WARNING

THIS PARACHUTE CONTAINS A CARTRIDGE ACTUATED DEVICE. FOR HANDLING INSTRUCTIONS SEE PARACHUTE PACKING MANUAL.

There is a tag attached to the safety pin that reads: "REMOVE PIN BEFORE PACKING." Assemblies shipped without a cartridge must have a shipping plug installed.

Service Life

Refer to NAVAIR 11-100-1-1 for the shelf/installed life of the spreading gun cartridge. The service life expiration date (month and year) is marked with indelible ink on the side of each cartridge.

NOTE: If the date the sealed container was opened is not available, the INSTALLED LIFE is computed from the date of manufacture as determined from the lot number.

Log Entries

You should enter on the Parachute History and Record Card the date of primary installation of the spreader gun to the parachute canopy, the lot number, expiration date, part number, CAD DODIC, and date of manufacture or overhaul of the cartridge.

Safety Precautions

Treat the spreader gun as a delicate instrument. The spreader gun cartridge is treated as class C ammunition in accordance with the general safety precautions given in the cartridge manual (NAVAIR 11-100-1.1).

WARNING

YOU MUST ALWAYS REMEMBER THAT THE BALLISTIC SPREADING GUN IS LETHAL WHEN ACTIVATED WITHOUT A CANOPY ATTACHED. DO NOT REMOVE THE SAFETY PIN UNTIL THE PROPER TIME AS PRESCRIBED IN THE PACKING MANUAL.

DO NOT REMOVE LANYARD RETAINING PIN WHEN REPLACING UPPER RETAINING CORD.

NOTE: Be sure that the cartridge service life will not expire prior to the next service check. Be sure the cartridge expiration date is entered in the Parachute History and Record Card.

REMOVAL OF BALLISTIC SPREADING GUN

Before you work on a spreader gun, always ensure that a safety pin is installed. If you have to remove a damaged or defective spreading gun, proceed as follows:

1. Loosen the screws holding the plates to the spreading gun slugs to allow suspension lines to be removed.
2. Slip all the suspension lines and attached loops from under the plates.
3. Disconnect the retaining cord from the vent lines.
4. Tie one end of a temporary 20-foot line to the vent lines, and tie its other end to the free end of the retaining cord.
5. Pull the retaining cord out of the canopy from the skirt end.
6. Untie the temporary 20-foot line from the retaining cord, and remove the damaged or defective gun from the table.
7. To install a new or repaired spreading gun, follow the procedures outlined in the applicable parachute assembly chapter in the *Emergency Personnel and Drogue Parachute Systems Manual*, NAVAIR 13-1-6.2.

BALLISTIC SPREADING GUN CARTRIDGE REPLACEMENT AND PULL-FORCE CHECK

WARNING

BEFORE YOU ATTEMPT TO REPLACE A CARTRIDGE, YOU MUST REMEMBER THE SPREADING GUN EMPLOYS AN EXPLOSIVE CARTRIDGE. FAILURE TO OBSERVE PROPER PROCEDURES COULD RESULT IN SERIOUS INJURY OR DEATH.

NOTE: You must use only the special tools furnished for cartridge removal or replacement. It is recommended that a helper assist you in performing the cartridge replacement by verifying procedures as each step is accomplished. You must perform a firing pin pull-force check each time you replace a cartridge.

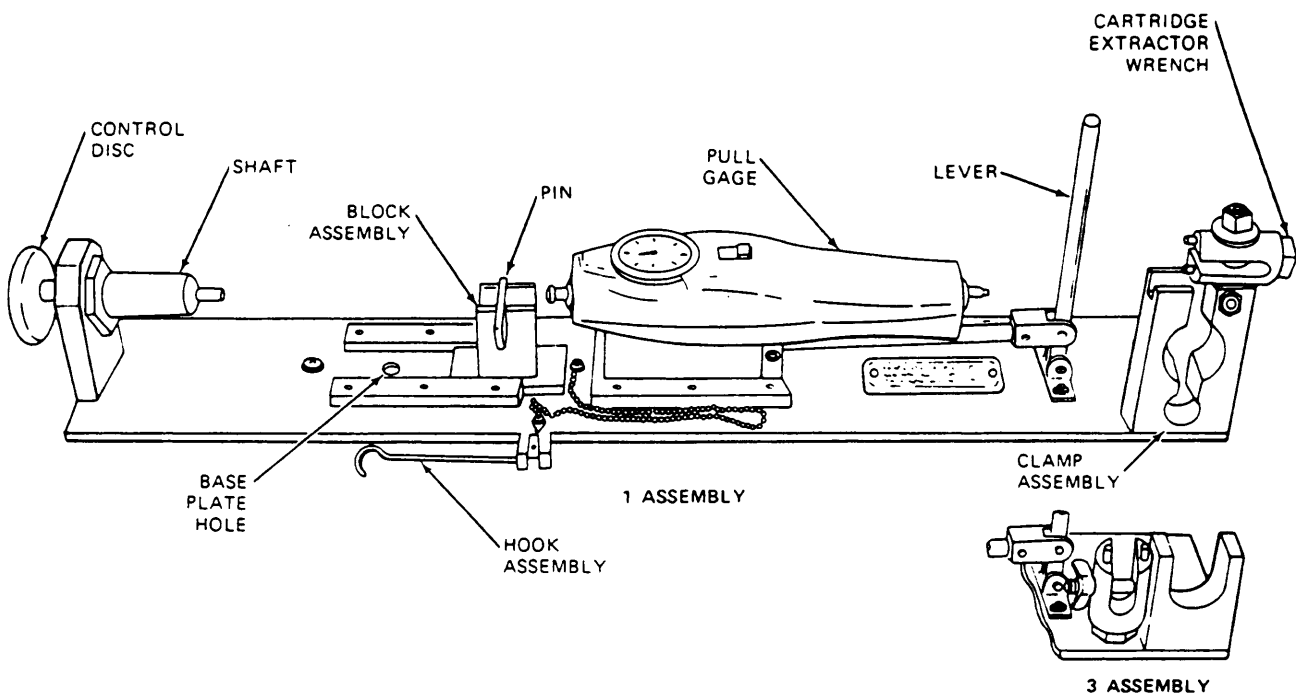


Figure 2-21.—Spreading gun test fixture.

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By following the steps outlined below, you can replace the cartridge and perform the firing pin pull-force test in a safe manner.

1. Clamp the spreading gun test fixture to the packing table. Use one C-clamp positioned as close as possible to the clamp assembly. See figure 2-21 for the test fixture parts identification.

2. You must remove the cartridge extractor wrench from the swivel bolt attached to the spreading gun clamp assembly.

3. Then place the cartridge end of the spreading gun into a spreading gun clamp assembly (fig. 2-22). Ensure that the lip on the clamp assembly circles the spreading gun housing. Route the retaining cord through the vertical slot in the center of the clamp and spread suspension lines to prevent entrapment between gun and clamp. Position the swivel bolt in the horizontal slot in the clamp, and torque the swivel bolt nut to $7 \pm 1/2$ foot-pounds.

4. Place the pins of the cartridge extractor wrench into holes in the cartridge. Loosen the cartridge using pressure against a 3/4-inch socket, as shown in figure 2-23.

NOTE: If you have difficulty in removing the cartridge by using the extractor wrench furnished with the test fixture, use a special cartridge extractor tool. Cut and remove the retaining cord at the base of the cartridge. Place the slot of the special tool over the retaining cord pin, and loosen the cartridge by using a 1/2-inch socket.

5. Remove the spreading gun from the clamp or V-block assembly. Manually unscrew and remove the cartridge from the chamber.

6. Remove the cartridge from the retaining cord by removing the pin. Retain the pin for reinstallation if required. The old cartridge must be disposed of in accordance with current directives.

7. Remove the safety pin from the spreading gun.

8. Spread the canopy skirt hem and suspension lines to expose the cartridge chamber. Slide the spreading gun onto the test fixture shaft

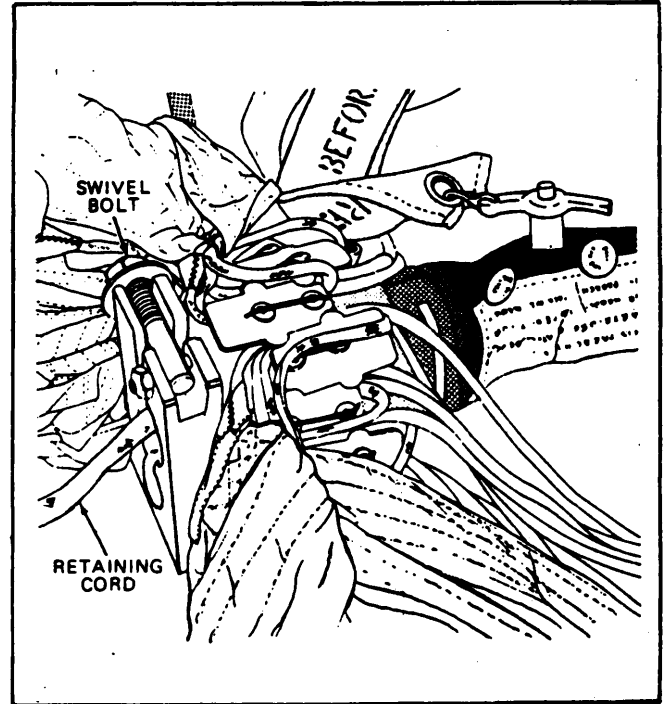


Figure 2-22.—Placing spreader gun in gun clamp.

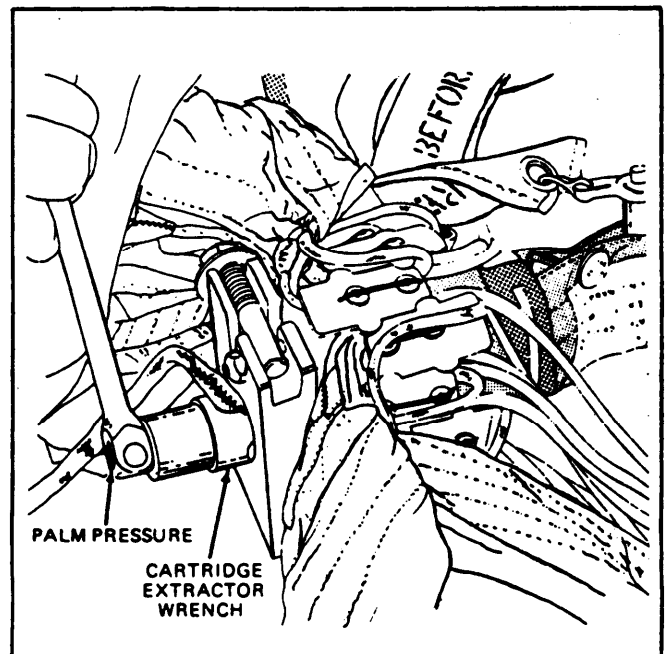


Figure 2-23.—Loosening cartridge.

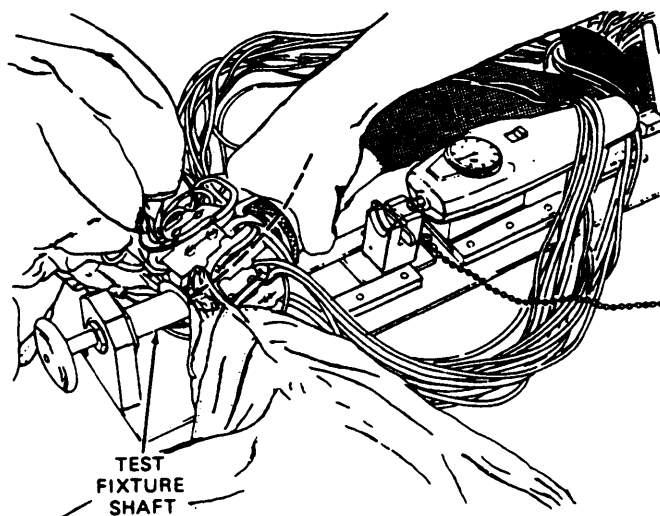


Figure 22-24.—Sliding on to test fixture.

so that the shaft butts against the bottom of the cartridge chamber (fig. 2-24).

9. Open the four snap fasteners on the spreading gun extractor sleeve to expose the firing pin housing. Slide the block assembly at the center of the test fixture under the firing pin housing until the block assembly pin slides into the baseplate hole. Align the firing pin so that the hole in the firing pin is horizontal. The firing lanyard is located at the top. (See figure 2-25.)

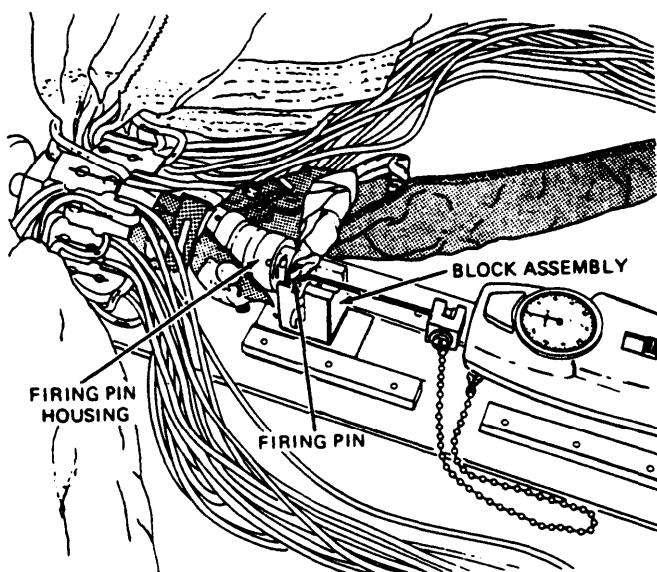


Figure 2-25.—Spreading gun installation.

10. Attach the hook assembly to the firing pin hole, and slide the hook assembly block over the nut that is attached to the pull gage. (See figure 2-21).

11. Move the switch on the pull gage to the center position. You must zero your meter needle by rotating the bezel on the dial. Move the switch to the full down position, away from the meter, for recording the pull force.

12. The QA verifies the test fixture lever firing pin releases. The pull force must go between 25 and 38 pounds. If a gun has failed the first test, it must be retested two more times. The gun must pass both retests. Record the force required to release the firing pin on the Parachute Configuration, Inspection, and History Record. When a gun fails, it is removed and returned to supply as a defective item.

13. After the pull-force measurement has been obtained, remove the hook assembly from the firing gun.

14. Push the firing pin back into the housing. Push the control disc firmly inward, forcing the firing pin out of the housing. Apply inward hand pressure to the firing pin as it moves out. Continue to move the control disc inward, applying hand pressure to the firing pin until it clicks into place. When a click is heard, the gun is cocked. Gently release the control disc while still exerting pressure on the pin.

15. The QA inspector must tug gently on the firing pin until the effect of spring loading is felt. If the pin moves without spring tension, the gun is not cocked, and step 14 must be repeated.

16. Release the block assembly by pulling the pin out of the hole in the baseplate and sliding the block away from the spreading gun. Remove the gun from the shaft. Do not remove the gun by pulling on the firing lanyard.

17. At this time, install the safety pin.

CAUTION

WHEN YOU ARE USING ALCOHOL TO CLEAN THE CARTRIDGE CHAMBER, DO NOT ALLOW ALCOHOL TO FLOW INSIDE THE GUN BECAUSE THIS COULD DAMAGE THE O-RINGS AND LUBRICATION.

18. Clean the cartridge chamber and threads with a small amount of denatured alcohol. Ensure that the old sealing compound and all foreign matter is removed. Tilt the gun to allow the alcohol to run out of the gun.

19. Feel the inside of the cartridge chamber to ensure that the slug pistons do not stick out inside the chamber. If the pistons do protrude, push them back as necessary. Feel the bottom of the chamber to ensure there is no foreign object in the chamber. The bottom should be smooth metal.

20. Prior to the cartridge installation, stamp on the cartridge, in the approximate position shown in figure 2-26, the following information: lot number, manufacturer's symbol, month and year of loading. Use black marking ink and make the characters as large as practicable for the available space. The same markings, plus expiration date and the can open date, must also be stamped on the cartridge head, using characters no smaller than 1/16 inch high.

21. Record the type of cartridge, part number, delay time, lot number, and service life expiration date on the Parachute Configuration, Inspection, and History Record.

22. Apply sealing compound to the top two threads of the cartridge. (See figure 2-26.)

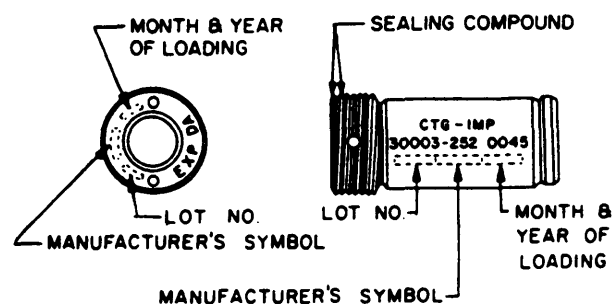


Figure 2-26.-Cartridge markings-head and side.

23. Attach the new cartridge to the retaining cord by passing the pin through the screw base of the cartridge and the loop that is located at the end of the retaining cord.

NOTE: Never force the cartridge into the chamber. This could damage the gun. When a cartridge is properly installed, the base should be approximately even with the top edge of the chamber. If the cartridge base is more than one thread above the edge, remove the cartridge and check the bottom of the chamber for any obstruction, such as protruding slug pistons.

24. Having inserted the cartridge into the chamber, you tighten it manually. If the cartridge stops before the threads are engaged, remove the cartridge and again check for protruding slug pistons. Push them back if necessary.

25. Replace the gun in the clamp or V-block assembly in accordance with steps 3 and 4. Using a cartridge extractor wrench and torque wrench with a 3/4-inch socket, you must torque the cartridge to 84 inch-pounds (plus or minus 12 inch-pounds).

26. Remove the spreading gun from the clamp or V-block assembly. Do not remove the safety pin. Put the cartridge extractor wrench back on the swivel/stanchion bolt.

27. Check stowage of the firing lanyard. Restow it if necessary.

28. Close the extractor sleeve. Now your job has been completed.

To install a ballistic spreader gun onto a parachute, you must refer to the *Emergency Personnel and Drogue Parachute Systems Manual*, NAVAIR 13-1-6.2. Repacking a parachute with a ballistic spreader gun is discussed in chapter 3 of this manual.

